

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate, or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302, and to the Office of Management and Budget Paperwork Reduction Project (C704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 10/5/00	3. REPORT TYPE AND DATES COVERED Progress Report 9/1/99 - 8/31/00	
4. TITLE AND SUBTITLE An Integrated System for Real-Time CTD Profiling Float Data on Basin Scales			5. FUNDING NUMBERS ONR N000149911068	
6. AUTHOR(S) Dr. Dean Roemmich , Professor/Research Oceanographer				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) University of California, San Diego Scripps Institution of Oceanography Physical Oceanography Research Division 9500 Gilman Drive La Jolla, CA 92093-0230			8. PERFORMING ORGANIZATION REPORT NUMBER UCSD 99-1303R1	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Office of Naval Research 800 North Quincy Street Arlington, VA 22217-5660			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Available to public			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) Please see attached progress report 20001019 012				
14. SUBJECT TERMS Argo, profiling floats, climate, global ocean observations			15. NUMBER OF PAGES 4	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT Same as report	

An Integrated System for Real-Time CTD Profiling Float Data on Basin Scales

Dean Roemmich

Physical Oceanography Research Division 0230

Scripps Institution of Oceanography

La Jolla, CA 92093-0230

phone: (858) 534-2307 fax: (858) 534-9820 email: droemmich@ucsd.edu

Award #: N000149911068

<http://www-argo.ucsd.edu>

LONG-TERM GOALS

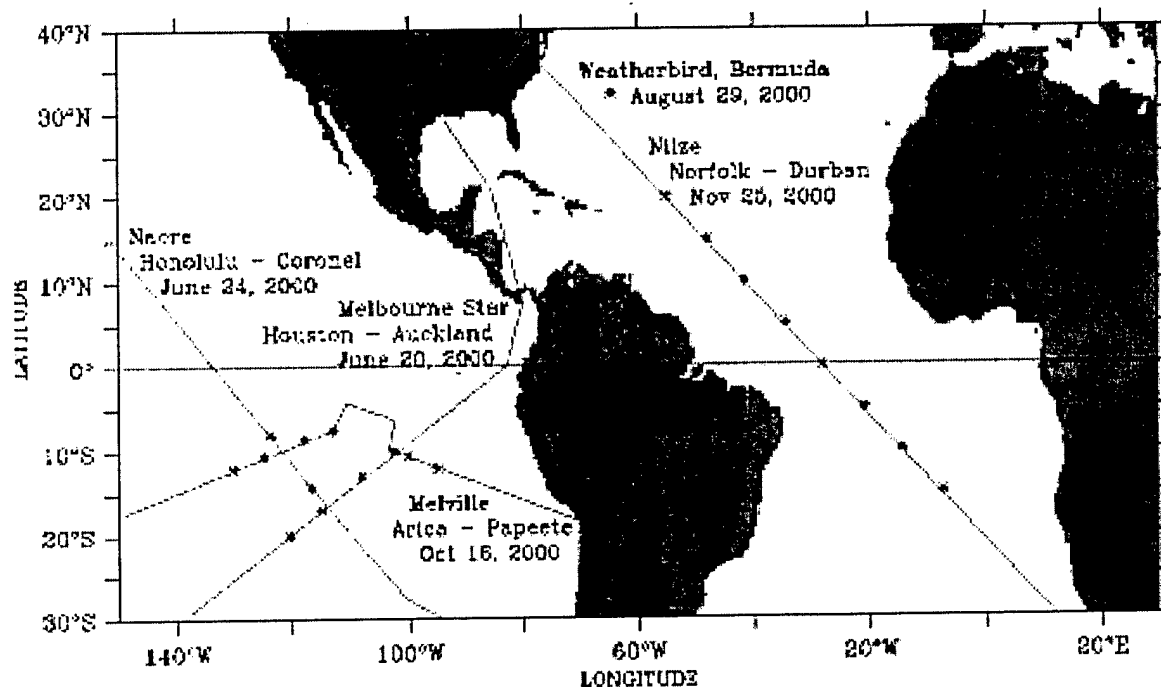
This award, together with those at our partner institutions (see below), initiates the U.S. component of the international Argo Project, via the National Ocean Partnership Program (NOPP). By 2005, Argo will deploy a global array of 3000 profiling CTD floats (Argo Science Team, 1998), plus a data system that will make all Argo data available to both operational users of real-time data and to scientific users of a high-quality data stream. The Argo array will provide unprecedented real-time views of the evolving physical state of the ocean. It will reveal the physical processes that balance the large-scale heat and freshwater budgets of the ocean and will provide a crucial dataset for initialization and assimilation in seasonal-to-decadal forecast models. Argo is a major initiative in oceanography, merging research and operational objectives to provide a uniquely valuable global dataset for climate science and other applications.

OBJECTIVES

Phase I of U.S. Argo will provide 55 profiling floats in the tropical Pacific and Atlantic Oceans. The Scripps part of this includes 22 floats in the tropical Pacific. These floats will demonstrate technological capabilities for fabrication and deployment of arrays in remote ocean locations. Recent technology developments will also be implemented during this deployment. New generation salinity sensors will be utilized for improved data quality. Capability for float deployments from fast ships and aircraft will be further developed to ensure that the Argo array can be successfully installed globally without dependency on research vessels. While the Argo data system is being developed by our partner institutions, we will participate through the delayed-mode quality control of profiles from SIO instruments.

APPROACH

Initial deployments of Argo floats have been identified for the Pacific and Atlantic (Fig 1), using both Volunteer Observing Ships and research vessels. This figure includes floats provided by SIO and by our partner institutions, University of Washington and Woods Hole Oceanographic Institution.



1. Positions of initial U.S. Argo float deployments, Pacific and Atlantic Oceans. Ship tracks are shown in red, with black symbols for float locations.

WORK COMPLETED

Four floats have been built and shipped – two were deployed from M/V Nacre (Fig 1) and two will shortly be deployed from R/V Melville.

Fabrication of the remaining 18 SIO floats is nearly completed and these will be shipped and deployed during the next 6-8 months, as deployment opportunities become available.

All data have been forwarded to the U.S. Argo Data at NOAA/AOML in Miami.

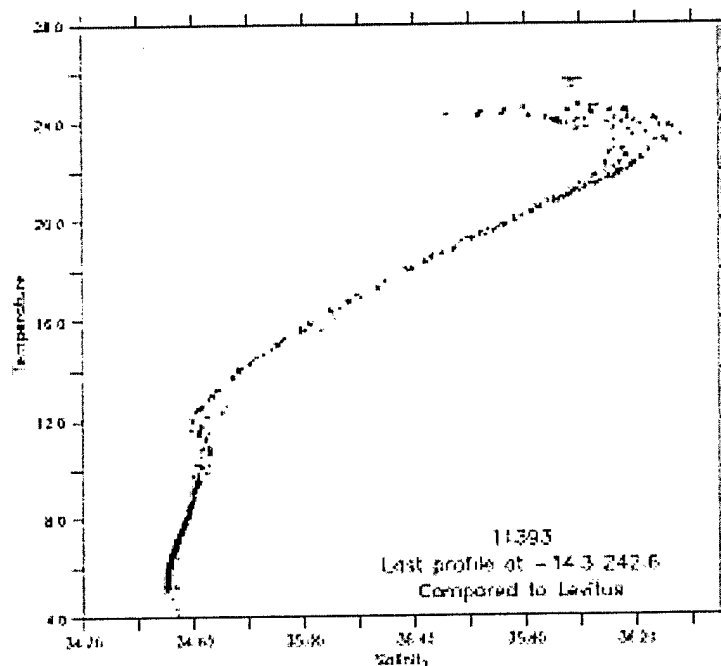
RESULTS

Of the two floats deployed in early July, both are operating normally, cycling to 1000 m parking depth every 10 days and returning a CTD profile collected while rising to the sea surface. Initial data quality appears excellent. T/S diagrams from both floats are very tight in the thermocline (Fig 2 shows one of these) and in good agreement with the Levitus climatology.

IMPACT/APPLICATION

Demonstration of the ability to deploy and maintain large-scale profiling float arrays in Phase I and II of U.S. Argo, as well as the public distribution of real-time and delayed mode datasets will confirm the

practicality of the program. Utilization of the Argo profiles in regional-to-global data assimilation systems will confirm its value.



2. *T/S diagram for the 7 cycles of data obtained so far from float 11393. The most recent position was 137.4°W, 14.3°S. Dark symbols are float data and green symbols are from Levitus climatology.*

TRANSITIONS

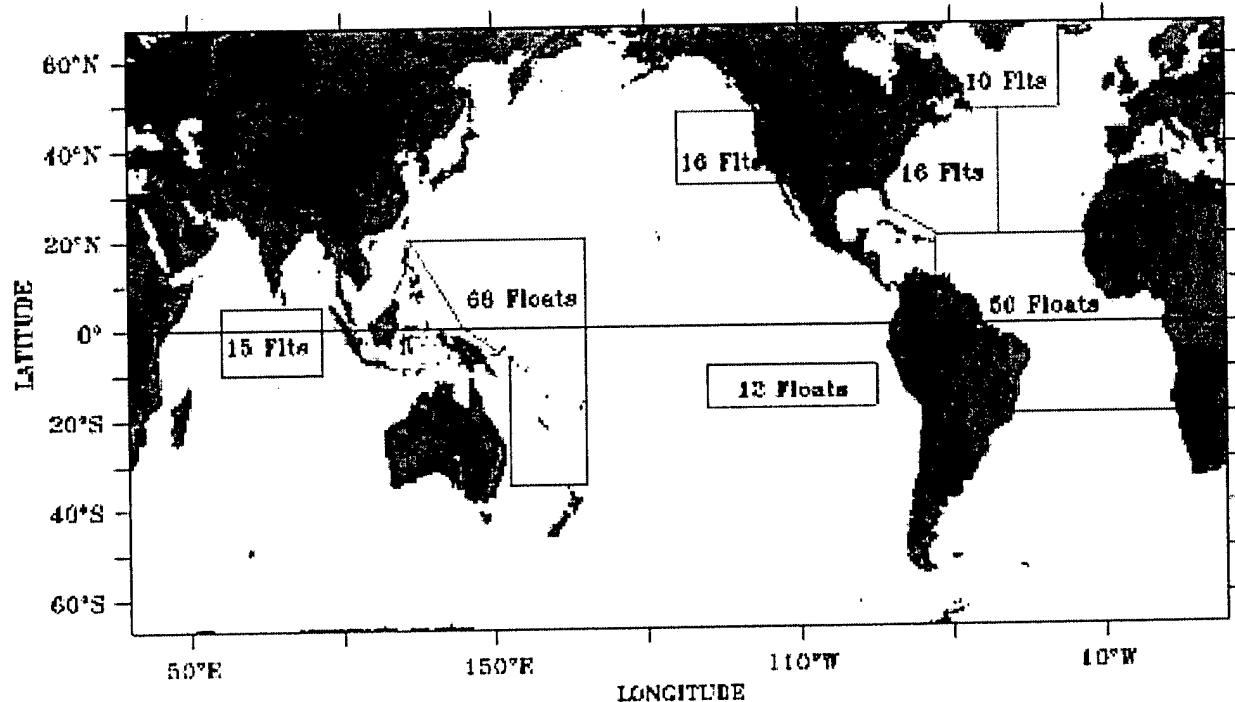
At a recent meeting of U.S. Argo principal investigators, Argo data users, and program managers it was decided to integrate the Phase I and Phase II deployments according to the plan shown in Fig 3. These deployments complement funded near-term deployments by international Argo partners (European countries, Canada, and New Zealand) as well as existing deployments of profiling floats from other U.S. projects in the North Atlantic and tropical Pacific, with the intention of building a complete Argo array in the Atlantic within 3 years. The tropical Pacific array will ramp up on a similar time-scale because of its anticipated high impacts on seasonal-to-interannual forecast capabilities as well as on fundamental science issues.

RELATED PROJECTS

1 – Other float-providing principal investigators in U.S. Argo are B. Owens and R. Schmitt of Woods Hole Oceanographic Institution and S. Riser of University of Washington.

2 – Lead principal investigators responsible for building the U.S. Argo Data System are R. Molinari of NOAA/AOML (Argo Data Center, real-time data stream) and G. Johnson of NOAA/PMEL (delayed mode quality control).

3 – A variety of data assimilation projects are dependent on successful deployment of the Argo array, including assimilation research activities under NOPP as well as operational modeling in the Navy and NOAA and modeling programs in partner countries as part of the Global Ocean Data Assimilation experiment.



3. Target regions for deployment of U.S. Argo floats, including 55 floats from Phase I and 132 floats from Phase II. These will complement concurrent Argo deployments by partner countries and existing U.S. profiling float arrays in the North Atlantic and eastern and central tropical Pacific.

REFERENCES

Argo Science Team, 1998. On the design and implementation of Argo: A global array of profiling floats. International CLIVAR Project Office Report No. 21